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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHOWDHURY, AFROZA Y

ART UNIT

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2629

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/821,198	Applicant(s) GABRIELSON ET AL.	
	Examiner AFROZA Y. CHOWDHURY	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 18, 19, 21, 24-34 and 39-52 is/are pending in the application.
- 4a) Of the above claim(s) 17, 20 and 35-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18, 19, 21, 24-34 and 39-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on **March 26, 2009** has been entered. Claims 1-16, 18, 19, 21, 24-34, and 39-52 are currently pending. Claims 17, 20, and 35-38 are withdrawn by the Applicant. The restriction requirement is made Final.
2. This application contains claims 17, 20, and 35-38 drawn to an invention nonelected with traverse in the reply filed on **August 28, 2008**. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 1-8, 21-26, and 45-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1, 21, and 45, “**increased number of gray levels is a multiple of said number of true gray levels natively supported by said color display**” is not described in the specification as submitted originally.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-16, 18, 19, 21-26, 39-44, and 45-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Applicant Admitted Prior Art** (herein after AAPA) in view of **Martin et al.** (US Patent 6,714,206).

As to claim 1, AAPA teaches a method for providing pseudo gray levels between gray levels on a color display, said method comprising:

determining a number of said true gray levels natively supported by said color display, wherein said true gray levels each correspond to all color drive settings for a pixel being equal value (fig. 1).

AAPA does not teach determining an increased number of gray levels that includes true gray levels and pseudo gray levels, dividing a received number that identifies a level of increased number of gray levels, and based on a remainder value

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obtained from said dividing, adjusting on or more of the color drive settings of a selected pixel to set the selected pixel to one of the pseudo gray levels.

Martin et al. discloses determining an increased number of gray levels desired to be available for display on said color display, wherein said increased number of gray levels includes said true gray levels and said pseudo gray levels (col. 1, lines 21-44, col. 4, lines 6-15), and

wherein said increased number of gray levels is a multiple of said number of true gray levels natively supported by said color display (fig. 13, col. 1, lines 21-45, col. 4, lines 6-15);

receiving a number that identifies a level of said increased number of gray levels to be displayed at a select pixel (fig. 13, col. 1, lines 21-45, col. 4, lines 6-15);

dividing said received number by said multiple to compute a quotient (fig. 13, col. 1, lines 21-45, col. 4, lines 6-15, col. 8, lines 14-42);

selecting a true gray levels of said true gray levels for the select pixel, said true gray level having each color drive setting for said pixel being equal to said quotient (fig. 13, col. 1, lines 21-45, col. 4, lines 6-15, col. 8, lines 14-42); and

based on a remainder value obtained from said dividing, adjusting one or more of said color drive settings of said select pixel to set the select pixel to one of the pseudo gray level, wherein said pseudo gray level will be perceived as falling between two gray levels of said gray levels (fig. 13, col. 1, lines 21-45, col. 4, lines 6-29, col. 5, lines 8-13, col. 8, lines 14-42).

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to modify AAPA's color display by incorporating the idea of Martin et al. of adjusting on or more of the color drive settings of a selected pixel to set the selected pixel to one of the pseudo gray levels based on a remainder obtained from dividing a received number that identifies a level of increased number of gray levels in order to to improve color intensity and brightness.

As to claim 2, Martin et al. discloses a method wherein said one or more drive settings of said pixel are adjusted by one level (fig. 13, col. 1, lines 21-45, col. 8, lines 14-42).

As to claim 3, Martin et al. teaches a method wherein there are three drive settings for said pixel (fig. 13, col. 1, lines 21-45, col. 8, lines 14-42).

As to claim 4, Martin et al. teaches a method wherein one drive setting differs from the other two drive settings by one level (fig. 13).

As to claim 5, Martin et al. teaches a method wherein said three drive settings are red, green and blue (fig. 13).

As to claim 6, Martin et al. teaches a method wherein said red drive setting is adjusted (fig. 13, col. 1, lines 21-45).

As to claim 7, Martin et al. teaches a method wherein said green drive setting is adjusted (fig. 13, col. 1, lines 21-45).

As to claim 8, Martin et al. teaches a method wherein said red drive setting and said green drive setting are adjusted (fig. 13, col. 1, lines 21-45).

As to claim 9, AAPA teaches a method of enhancing gray scale output on a color display, said method comprising: entering an input number that identifies a level of gray to be displayed (fig. 1, [0003]).

AAPA does not teach extracting a smaller ranged number from said input number and dividing said input number by a factor to obtain a displayable gray scale number and adjusting said displayable gray scale number based on a remainder obtained from said dividing.

Martin et al. discloses a method of extracting a smaller ranged number from said input number, wherein said smaller ranged number is associated with a true gray value (col. 1, lines 28-45, col. 5, line 67 – col. 6, line 11);

dividing said input number by a factor to obtain a displayable gray scale number (figs. 11, 12, 13, col. 1, lines 21-53, col. 7, lines 1-7, lines 37-39, col. 8, lines 14-54); and

adjusting said displayable gray scale number based on a remainder obtained from said dividing (fig. 13, col. 1, lines 21-53, col. 4, lines 5-17, col. 8, lines 14-54).

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to improve AAPA's color display by incorporating the idea of Martin et al. of extracting a smaller ranged number from said input number and dividing said input number by a factor to obtain a displayable gray scale number and adjusting displayable gray scale number based on a remainder obtained from said dividing to improve color intensity and brightness.

As to claim 10, AAPA (as modified by Martin et al.) teaches a method wherein said input number identifies one of 256 gray levels that can be perceived (fig. 1 in AAPA, col. 1, lines 28-40 in Martin et al.).

As to claim 11, AAPA (as modified by Martin et al.) teaches a method wherein said smaller range number is associated with one of 64 true gray values that can be displayed on said color display (fig. 1, [0003] in AAPA, col. 1, lines 28-40 in Martin et al.).

As to claim 12, Martin et al. teaches a method wherein said factor is 4 (figs. 12, 13, col. col. 1, lines 28-40).

As to claim 13, Martin et al. discloses a method wherein said remainder indicates how much brightness is needed for said displayable gray scale number (fig. 13, col. 8, lines 14-54).

As to claim 14, Martin et al. teaches a method comprising: outputting said true gray value if said remainder is zero (fig. 13, col. 8, lines 14-18).

As to claim 15, Martin et al. teaches a method comprising: increasing red, green or blue outputs associated with said displayable gray scale number if said remainder is not zero (fig. 13, col. 8, lines 14-54).

As to claim 16, Martin et al. teaches a method comprising: adjusting said red output by one if said remainder is one (fig. 13, col. 8, lines 14-54).

As to claim 18, Martin et al. teaches a method comprising: adjusting said green output by one if said remainder is two (fig. 13, col. 8, lines 14-54).

As to claim 19, Martin et al. teaches a method comprising: adjusting said red and green outputs by one if said remainder is three (fig. 13, col. 8, lines 14-54).

Claim 21 rejected the same as claim 1 above, except:

Martin et al. teaches capturing an image to be represented as multiple shades of gray (fig. 13, col. 1, lines 21-45, col. 5, lines 8-13); and

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mapping said multiple shades of gray of said image to provide a depth of gray levels for a pixel beyond what is available in gray scale on said color display (fig. 13, col. 1, lines 21-45, col. 5, lines 8-13).

As to claim 22, Martin et al. teaches a method wherein said multiple shades of gray are mapped to both gray scale levels supported by said color display and color pixels determined to provide levels of gray between said gray scale levels (fig. 13, col. 1, lines 21-45, col. 5, lines 8-13).

As to claim 23, Martin et al. teaches a method comprising: adjusting said color pixels to provide levels of gray between said gray scale levels (fig. 13, col. 1, lines 21-45, col. 5, lines 8-13).

As to claim 24, Martin et al. teaches a method wherein said color pixels are represented by three drive settings (fig. 13).

As to claim 25, Martin et al. teaches a method wherein said three drive settings are red, green and blue (fig. 13).

As to claim 26, Martin et al. teaches a method comprising: adjusting said three drive settings based on the level of brightness needed for display (fig. 13, col. 1, lines 21-45, col. 5, lines 8-13).

Claim 39 is rejected the same as claim 9 above.

Claims 40-44 are rejected the same as claims 14-16, 18, and 19, respectively.

Claim 45 is rejected the same as claim 1 above.

As to claim 46, Martin et al. a method wherein said color drive settings comprise red, green, and blue drive settings, and wherein the method further comprising:

when said remainder is zero, determining no adjustment to be made to said preliminary value %r any of the color drive settings for the select pixel; when said remainder is a first non-zero value, determining an increase in intensity of said red or blue drive setting; when said remainder is second non-zero value, determining an increase in intensity of said green drive setting; and when said remainder is a third non-zero value, determining an increase in intensity of said green drive setting and an increase in intensity of one of said red and blue drive setting (fig. 13, col. 1, lines 21-45, col. 8, lines 14-54).

As to claim 47, Martin et al. teaches a method wherein multiple is four (col. 1, lines 21-45).

As to claim 48, Martin et al. teaches a method wherein said number of true gray levels natively supported by said color display is 64, and wherein said desired number of gray levels to be available for display on said color display is 256 (col. 1, lines 21-45).

Claim 49 is rejected the same as claim 1 above.

Claims 50-52 are rejected the same as claims 46-48, respectively, above.

7. Claims 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Applicant Admitted Prior Art** (herein after AAPA) in view of **Martin et al.** (US Patent 6,714,206) and in further view of **Rozzi** (US Pub. 2002/0180751).

All the claim limitations of claim 27 are rejected the same as claim 9 except:
a field programmable gate array (FPGA) for generating an input number, and
a color display for receiving said adjusted color outputs from said FPGA.

AAPA (as modified by Martin et al.) does not specifically teach a field programmable gate array (FPGA) for generating an input number, and a color display for receiving said adjusted color outputs from said FPGA.

Rozzi discloses a field programmable gate array (FPGA) (fig. 1(12)) for generating an input number (fig. 9, [0032], [0035]), and

a color display (fig. 1(10)) for receiving said adjusted color outputs from said FPGA (fig. 9, [0032], [0035]).

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to include Rozzi's field programmable gate array (FPGA) for generating an input number, and color display for receiving said adjusted color outputs from said FPGA into the display device of AAPA (as modified by Martin et al.) in order to display accurate color (see [0022], [0032] in Rozzi).

As to claim 28, Martin et al. teaches a system wherein said input number identifies a pseudo gray level to be displayed (figs. 11-13).

Claims 29 and 30 are rejected the same as claims 9 and 14, respectively.

As to claim 31, Martin et al. teaches a system wherein said color outputs to be adjusted are associated with a red part and a green part of a pixel (fig. 13).

As to claim 32, AAPA (as modified by Martin et al. and Rozzi) teaches a system wherein said FPGA adjusts said color output associated with a red part of a pixel by one if said remainder is one ([0032], [0035] in Rozzi, fig. 13 in Martin et al.).

As to claim 33, AAPA (as modified by Martin et al. and Rozzi) teaches a system wherein said FPGA adjusts said color outputs associated with a red part and green part of a pixel by one if said remainder is three ([0032], [0035] in Rozzi, fig. 13 in Martin et al.).

As to claim 34, AAPA (as modified by Martin et al. and Rozzi) teaches a system wherein said FPGA adjusts said color output associated with a green part of a pixel by one if said remainder is two ([0032], [0035] in Rozzi, fig. 13 in Martin et al.).

Response to Arguments

8. Applicant's arguments filed **March 26, 2009** have been fully considered but they are not persuasive.

On page 16 (2nd paragraph) and page 13 (last paragraph) of Remarks, Applicants state that that Martin fails to teach **adjusting displayable gray scale number based on a remainder obtained from dividing a received number (that identifies a level of an increased number of gray levels to be displayed at a pixel)**. The Examiner respectfully disagrees to this assertion. Martin teaches adjusting displayable gray scale number based on a remainder obtained from dividing a received number that identifies a level of an increased number of gray levels to be displayed at a pixel (see fig. 13, col. 1, lines 21-45, col. 4, lines 6-29, col. 5, lines 8-13, col. 8, lines 14-42). Since the claims are very broad, these are read on this reference.

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AFROZA Y. CHOWDHURY whose telephone number is (571)270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
6/9/2009

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